



A comparison of the thermal adaptability of people accustomed to air-conditioned environments and naturally ventilated environments

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Abstract:

It has been reported previously that people who are acclimated to naturally ventilated (NV) environments respond to hot and warm environments differently than people who are acclimated to air-conditioned (AC) environments. However, it is not clear whether physiological acclimatization contributes to this discrepancy. To study whether living and working in NV or AC environments for long periods of time can lead to different types of physiological acclimatization, and whether physiological acclimatization has an important influence on people's responses of thermal comfort, measurements of physiological reactions (including skin temperature, sweat rate, heart rate variability, and heat stress protein 70) and thermal comfort responses were conducted in a 'heat shock' environment (climate chamber) with 20 people (10 in the NV group and 10 in the AC group). The results showed that the NV group had a significantly stronger capacity for physiological regulation to the heat shock than the AC group. In other words, the NV group did not feel as hot and uncomfortable as the AC group did. These results strongly indicate that living and working in indoor thermal environments for long periods of time affects people's physiological acclimatization. Also, it appears that long-term exposure to stable AC environments may weaken people's thermal adaptability. **PRACTICAL IMPLICATIONS:** This study examined the psychological and physiological differences of thermal adaptability of people used to air-conditioned environments and naturally ventilated environments. The results suggested that long-term exposure to stable air-conditioned environments may weaken people's thermal adaptability. Therefore, it might be advantageous for people to spend less time in static air-conditioned environments; this is not only because of its possible deleterious impact on people's physiological adaptability, but also because the air-conditioners' high-energy consumption will contribute to the effects of global warming.

Source: <http://dx.doi.org/10.1111/j.1600-0668.2011.00746.x>

Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Temperature

Temperature: Extreme Heat

Geographic Feature:

resource focuses on specific type of geography

Climate Change and Human Health Literature Portal

None or Unspecified

Geographic Location: ☒

resource focuses on specific location

Non-United States

Non-United States: Asia

Asian Region/Country: China

Health Impact: ☒

specification of health effect or disease related to climate change exposure

Injury

Mitigation/Adaptation: ☒

mitigation or adaptation strategy is a focus of resource

Adaptation

Population of Concern: A focus of content

Other Vulnerable Population: People with long-term exposure to stable air-conditioned environments

Resource Type: ☒

format or standard characteristic of resource

Research Article

Resilience: ☒

capacity of an individual, community, or institution to dynamically and effectively respond or adapt to shifting climate impact circumstances while continuing to function

A focus of content

Timescale: ☒

time period studied

Time Scale Unspecified

Vulnerability/Impact Assessment: ☒

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content